Claims

[c1]   1. A system comprising:

a host device having two or more ports configured to be coupled to a sequential device via corresponding links, wherein the host device is configured to associate a command identifier with a command, to transmit the command via a first one of the ports, to detect a failure associated with the transmission of the command via the first one of the ports, and to transmit the command via a second one of the ports.

[c2]   2. The system of claim 1, wherein the host device is configured to associate the command identifier with the command by counting commands transmitted from the host device to the sequential device and associating the count with the corresponding command, the system further comprising a router coupled between the host device and the sequential device, wherein the router is configured to count commands transmitted from the host device to the sequential device and to associate the count with the corresponding command.

[c3]   3. The system of claim 2, wherein the host device is configured to initiate transmission of a set of commands to the sequential device by issuing a first command to establish a command stream, wherein the host device and the router are configured to begin counting commands after receiving the first command.

[c4]   4. The system of claim 1, wherein the host is configured to make the command identifier explicit in the command.

[c5]   5. The system of claim 4, wherein the host device is further configured to transmit subsequent commands and corresponding command identifiers via the second one of the ports.

[c6]   6. The system of claim 4, further comprising two or more communication links corresponding to the two or more ports.

[c7]   7. The system of claim 6, wherein the communication links comprise Fibre Channel links.

[c8]   8.The system of claim 7, wherein the communication links are configured to provide Class 3 service.

[c9]   9.The system of claim 4, further comprising a router coupled to the communication links to receive the command and command identifier from the host device, wherein the router is configured to be coupled to the sequential device.

[c10]   10.The system of claim 9, wherein the router is configured to: identify the command identifier transmitted via the second one of the ports as identical to the command identifier transmitted via the first one of the ports; and forward a portion of the command to the sequential device, wherein the forwarded portion of the command comprises a portion of the command that was not received by the sequential device via the first one of the ports.

[c11]   11.The system of claim 9, wherein the host is configured to request a status of the command via the second one of the ports.

[c12]   12.The system of claim 11, wherein the host is configured to receive an indication of a number of data bytes received by the router in response to requesting the status of the command.

[c13]   13.The system of claim 12, wherein the host is configured to request that error recovery begin with a next data byte following a last received data byte.

[c14]   14.The system of claim 13, wherein the host is configured to receive an indication of acceptance to beginning error recovery.

[c15]   15.The system of claim 9, further comprising a sequential device coupled to the router to receive the command.

[c16]   16.The system of claim 15, wherein the sequential device comprises a tape drive.

[c17]   17.The system of claim 15, wherein the sequential device comprises a SCSI device.

[c18]   18.The system of claim 4, further comprising a sequential device coupled to the

communication links to receive the command and command identifier from the host device.

[c19]   19.The system of claim 4, wherein the host device is configured to request a status of the command via the second one of the ports.

[c20]   20.The system of claim 19, wherein the host device is configured to receive a number of data bytes received in response to requesting the status of the command.

[c21]   21.The system of claim 20, wherein the host device is configured to request that error recovery begin with a next data byte following a last received data byte.

[c22]   22.The system of claim 21, wherein the host device is configured to receive an indication of acceptance to beginning error recovery.

[c23]   23.A method comprising:
associating a first command identifier with a first command;
transmitting the first command via a first link;
detecting a failure of the first link; and
transmitting at least a portion of the first command and first command identifier via a second link.

[c24]   24.The method of claim 23, the method is implemented in a host and a router coupled between the host and a sequential device, wherein associating a first command identifier with a first command comprises the host and the router counting commands transmitted from the host device to the sequential device and associating the count with the corresponding command, and wherein transmitting the first command via a first link, detecting a failure of the first link and transmitting at least a portion of the first command and first command identifier via a second link are performed by the host.

[c25]
25.The method of claim 24, further comprising initiating transmission of a set of commands to the sequential device by issuing a first command to establish a command stream, wherein the host device and the router are configured to

begin counting commands after receiving the first command.

[c26]   26.The method of claim 23, wherein associating the first command identifier with the first command comprises making the first command identifier explicit in the first command.

[c27]   27.The method of claim 26, further comprising, prior to transmitting at least a portion of the first command and first command identifier via a second link, requesting a status of execution of the first command, receiving the status of execution of the first command, requesting recovery starting at a next byte following a last byte previously received and receiving acknowledgement of acceptance of the recovery request.

[c28]   28.The method of claim 27, wherein the status indicates a number of bytes of the first command actually received by the router.

[c29]   29.The method of claim 26, further comprising receiving at the router the first command and first command identifier via the second link and executing an unexecuted portion of the first command.

[c30]   30.The method of claim 26, further comprising identifying the first command and first command identifier received via the second link, identifying a redundant portion of the first command received via the second link and discarding the redundant portion of the first command.

[c31]   31.A software product configured to cause a device programmed with the software product to perform the method comprising:
associating a first command identifier with a first command;
transmitting the first command via a first link;
detecting a failure of the first link; and
transmitting at least a portion of the first command and first command identifier via a second link.

[c32]
32.The method of claim 31, the method is implemented in a host and a router coupled between the host and a sequential device, wherein associating a first command identifier with a first command comprises the host and the router

counting commands transmitted from the host device to the sequential device and associating the count with the corresponding command, and wherein transmitting the first command via a first link, detecting a failure of the first link and transmitting at least a portion of the first command and first command identifier via a second link are performed by the host.

[c33]   33.The method of claim 32, further comprising initiating transmission of a set of commands to the sequential device by issuing a first command to establish a command stream, wherein the host device and the router are configured to begin counting commands after receiving the first command.

[c34]   34.The method of claim 31, wherein associating the first command identifier with the first command comprises making the first command identifier explicit in the first command.

[c35]   35.The software product of claim 31, wherein the method further comprises, prior to transmitting at least a portion of the first command and first command identifier via the second link, requesting a status of execution of the first command, receiving the status of execution of the first command, requesting recovery starting at a next byte following a last byte previously received and receiving acknowledgement of acceptance of the recovery request.

[c36]   36.The software product of claim 35, wherein the status indicates a number of bytes of the first command actually received.

[c37]   37.The software product of claim 25, wherein the software product is implemented in a device driver.

[c38]   38.The software product of claim 25, wherein the software product is implemented in a shim driver between a device driver and a command driver.

[c39]   39.The software product of claim 25, wherein the command driver comprises a SCSI driver.